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Abstract

Parkinson's disease involves intracellular deposits of alpha-synuclein in the form of Lewy bodies and Lewy neurites. The e

alpha-Synuclein-containing aggregates represent a feature of a variety of neurodegenerative disorders, including Parkins

A lack of evidence supporting a role of heritability in the development of idiopathic Parkinson's disease (PD) has implicat

Mutations in parkin are currently recognized as the most common cause of familial Parkinsonism. Emerging evidence als

Extensive epidemiological data in humans and studies in animal models of Parkinson's disease (PD) suggest that sporadic

Environmental paraquat and neonatal iron exposure have both separately been suggested as potential risk factors for sp

Both genetic and environmental factors are thought to be involved in the aetiology of Parkinson's disease (PD). Oxidative

As Parkinson's appears to be a multifactoral disorder, the use of animal models to investigate combined effects o

Parkinson's disease (PD) is one of the common neurodegenerative diseases that result in the progressive damage of dop

Parkinson disease (PD) is a neurodegenerative disease characterized by death of dopaminergic neurons in the substantia

Epidemiological studies indicate a role of genetic and environmental factors in Parkinson's disease involving alterations o

Mitochondrial dysfunction has been frequently implicated in the neurodegenerative process that underlies Parkinson's d

Parkinson's disease (PD) is characterized by loss of DA dopaminergic (DA) neurons in the substantia nigra pars compacta

Parkinson's disease is associated with mitochondrial decline in dopaminergic neurons of the substantia nigra. One of the

Paraquat (PQ) and maneb (MB) are able to induce neurotoxic effects by promoting alpha-synuclein (alpha-syn) aggregate

Parkinson disease is a debilitating and incurable neurodegenerative disorder affecting approximately 1-2% of people ove

Epidemiological studies have suggested a correlation of pesticides and Parkinson's disease (PD) while genetic and bioche

Oxidative stress (OS) stimulates autophagy in different cellular systems, but it remains controversial if this rule can be ge

Cytoplasmic inclusions known as Lewy bodies, a hallmark of Parkinson's disease (PD) pathology, may protect against cyt

Currently, most neurotoxicological investigations are still conducted using various animal models (e.g. chickens, rodents)

We examined effects of three structurally related pyridinium compounds, 1-methyl-4-phenylpyridinium (MPP+), paraqua

Apoptosis plays an important role in neurodegeneration, although the mechanisms and mediators in the brain are largel

Paraquat was taken up by PC12 cells in a carrier-mediated, saturable manner. When PC12 cells were permeabilized with

Although paraquat has been shown to cause oxidative damage to neuronal cells, little is known about its effect on glial ce

Drugs and certain environmental toxins may be responsible for the pathogenesis of Parkinson's disease. We have used p

The effect of the induction of i-NOS in primary glial cultures was studied with respect to the protein levels of reactive oxy

Paraquat (PQ) is a well described pneumotoxicant that produces toxicity by redox cycling with cellular diaphorases, there

The excitatory amino acid glutamate serves important neurologic functions, but overactivation of its N-methyl-D-aspart

Various structurally unrelated chemicals [2,5 hexandione, acrylamide, organophosphates like mipafox, beta,beta iminodi

Recent etiological study in twins (Tanner et al. 1999) strongly suggests that environmental factors play an important role

Recent studies have demonstrated that inhibition of the proteasome, an enzyme responsible for the majority of intracell

Treatment of neuroblastoma cells with the copper chelator triethylene tetramine tetrahydrochloride induced intracellula

HumPrim	AniPrim	AniSec	InvAll	Does this article contain ADME data?
etiology of the disease is unknown, hov			InvAll	
on's disease (PD). However		AniSec	InvAll	
ed exposures to environmental contam			InvAll	NOADME
o suggests that parkin expression varia			InvAll	
forms of the d	AniPrim	AniSec	InvAll	
oradic forms of Parkinson's		AniSec	InvAll	
damage, mitochondrial and proteasor			InvAll	NOADME
f genetic and	AniPrim	AniSec	InvAll	
aminergic neurons. Environmental exp			InvAll	NOADME
nigra region of the brain. Iron content			InvAll	NOADME
f the neuronal alpha-synuclein (alpha-			InvAll	
isease (PD), but the basis for this impai			InvAll	NOADME
[redacted]			InvAll	
genes linked with the onset of Parkins			InvAll	
s and altering tyrosine hydroxylase (TH			InvAll	NOADME
r 65 years of age. Oxidative		AniSec	InvAll	
mical studies have implicated the ubiq			InvAll	NOADME
neralized. We have analyzed the effect			InvAll	NOADME
HumPrim			InvAll	NOADME
. In this report, alternative strategies o			InvAll	NOADME
it, and 1-methyl-4-(4'-nitrophenyl) pyri			InvAll	NOADME
unknown. Because microglial cells ha			InvAll	NOADME
digitonin (50 microg/ml) lipid peroxida			InvAll	NOADME
lls. Thus the effect of paraquat on glia			InvAll	NOADME
araquat as a model toxin for this study			InvAll	NOADME
gen species (ROS) scavenging enzymes			InvAll	NOADME
by elevating intracellular levels of supe			InvAll	NOADME
te (NMDA) receptor is toxic to neurons			InvAll	NOADME
propionnitrile (IDPN), 3-nitropropionic			InvAll	NOADME
in typical, non-familial Parkinson's dise			InvAll	
ular proteolysis, may contribute to the			InvAll	
r decrease of copper content parallele			InvAll	NOADME

Cell type (cell line, primary cells, recombinant protein)
Recombinant alpha-synuclein
Recombinant alpha-synuclein
PC12 cell line or primary ventral mesencephalic cultures
SH-SY5Y cell line
N27 cell line or E15 primary mesencephalic cultures
E14-15 primary mesencephalic neuron-glia and microglial cultures
SH-SY5Y cell line
N27 cell line or E15 primary mesencephalic cultures
PC12 cell line
BE2-M17 cell line or primary cortical neurons or primary astrocyte cultures
SH-SY5Y and SK-MEL-2 cell lines
Primary fibroblasts from PD patients and controls
Human induced pluripotent stem cells differentiated into dopamine neurons
E14-15 primary mesencephalic neuron cultures or C. elegans (HeLa cells also used but not considered a relevant cell type
SH-SY5Y cell line
SH-SY5Y cell line
SK-N-MC cell line
astrocytoma U373 cells
SK-N-MCu cell line
Primary neuronal cell cultures
PC12 cell line
N9 microglial cells
PC12 cell line
C6 glioma cells
PC12 cell line
Glial cell cultures from the neocortex of newborn
CPA-47 endothelial cell line
Cortical neuron cell culture
nigral dopaminergic cell line, SN4741
SH-SY5Y cell line
SH-SY5Y cell line

Species	Exposure duration	Exposure details
Unclear	Up to 500 hours	
Unclear	Up to 40 hours	
Rat	6 to 48 hours	
Human	24 hours	
Rat or Mice	18 or 24 hours	
Mice	5 days or 10-30 minutes	
Human	48 hours	
Rat or Mice	24 hours	
Rat	12 hours	
Human or Mice	24 hours	
Human	72 hours	
Human	48 hours	
Human		
Mice or C. elegans	24 or 72 hours	
Human	24 or 48 hours	
human	24 hours	
human	24 hours to 1 week	
human	24 hours	
human	48 hours	
rat	3 and 7 days	
rat	6 hours	
mouse	4 hours	
rat	up to 5.5 hours	
rat	48 hours	
rat	48	
rat	8 hours	
cow	5 hours	
rat	7 days	
human	6, 12, 24, 48 hours	
human	12 and 24 hours	
human	24 hours	

Dose (uM)	alpha synuclein, Tau phosphorylation, tubulin	DA (TH+) neurons	Dopamine (DA and metabolite levels, DAT and receptor expression, TH immunoreactivity)	Cell viability (LDH levels, apoptosis, total cell number)
100	1			
10, 100, 500, or 1000	1			
10, 50, 75, or 100				1
1000 or 5000				
30, 100, 200, 300, or 400				1
0.5, 1, or 2		1		
300	1			1
30 or 350		1		1
50, 100, 200, or 500				1
2000 or 4000				1
150, 250, or 450	1			1
300	1			1
12.5 or 200		1		
50, 100, 250, 500, or 1000	1		1	1
100 - 500	1			1
0.01 to 10				1
100				
10, 50, 100				
1, 5, 10, 50, 100 ug/ml				1
0, 50, 100, 500				1
500				
250 or 1000				1
250, 500, 1000				1
500				1
50, 100, 500, 1000				1
0, 25, 75, 150, 300, 600				1
0.1, 1, 5, 10, 50 ug/ml	1			1
800		1		1
20, 200				1
500 or 1000				1

Oxidative stress	Proteasome (Parkin, proteasomal activity)	Mitochondrial effects	Other (general expression changes, etc.)	ROS induction only	foreign language
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	1				
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		1			
			1		
1		1			
	1				
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	1				
1					
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1					
				1	
		1			
1	1	1			
1					

not relevant

no Paraquat alone treatment group for in vitro studies

notes	ICF Actions taken
only using paraquat to induce oxidative stress, not relevant to PD outcomes	

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SH-SY5Y cells transfected with the enzymatically inactive Cu,Zn superoxide dismutase mutant H46R were more resistant t
Using the inactivation of mitochondrial and cytosolic aconitases as markers of compartment-specific superoxide (O2(-)) p
Oxidative stress caused by an increase in free radicals plays an important role in neuronal death. We investigated the effe
PURPOSE: In a recent study, it was demonstrated that docosahexaenoic acid (DHA) promotes the survival of retinal photo
Oxidative stress has been discussed as crucial mechanism of neuronal cell death in the adult brain. However, it was not cl
Oxidative stress is supposed to play an important role in demyelinating diseases. Oligodendrocytes are the myelin-formir
Paraquat (PQ; 1,1'-dimethyl-4,4'-bipyridinium dichloride) is widely used as a universal herbicide. Although systemic treat
We examined the toxicity of paraquat, a possible environmental risk factor for neurodegenerative disorders like Parkinso
We previously identified a novel endogenous substance, serofendic acid, from a lipophilic extract of fetal calf serum. Serc
Oxidative stress is currently considered a mediator of cell death in several neurodegenerative diseases. Notably, it may p
Oxidative stress has been implicated in neuronal death caused by cerebral ischemia or some neurologic disorders. Chemi
Neuronal cell death induced by oxidative stress is correlated with numerous neurodegenerative diseases, including Alzhe
Oxidative stress and apoptosis play pivotal roles in the pathogenesis of neurodegenerative diseases. We investigated the
Reactive oxygen species (ROS) are implicated in reperfusion injury after transient focal cerebral ischemia. The antioxidan
Mechanisms involved in paraquat neurotoxicity that selectively target nigrostriatal dopaminergic neurons remain relative
The adaptive responses to H2O2 and the resulting protective effect against oxidative stress have been investigated using
The exposure of immortalized rat neuroblast cells to MPP(+) and paraquat results in cell death. Heat shock pre-treatmen
Erythropoietin (Epo) expression, which regulates erythropoiesis, has been shown in rat and mouse brain after hypoxia. A
Reactive oxygen species (ROS) contribute to the development of various human diseases. Cu,Zn-superoxide dismutase (S
Paraquat is a herbicide with a potential risk to induce parkinsonism due to its demonstrated neurotoxicity and its strong s
Previous work demonstrated that a brief, sublethal excitotoxic insult strikingly increased the sensitivity of cortical neuron
Mitochondrial damage is linked to many neurodegenerative conditions, such as Parkinson's disease, Alzheimer's disease
Although reactive oxygen species (ROS) at physiological concentrations are required for normal cell function, excessive pr
Identification of common mechanistic principles that shed light on the action of the many chemically diverse toxicants to
Parkinson's disease (PD) is characterized by selective loss of dopaminergic neurons in the substantia nigra of the brain. Al
Autophagy is a degradative mechanism involved in the recycling and turnover of cytoplasmic constituents from eukaryot
Paraquat (PQ(2+)) is a prototypic toxin known to exert injurious effects through oxidative stress and bears a structural sin
Previous studies have suggested that Ginkgo biloba extract (EGb761) has a protective potentiality against apoptosis of ne
The JAK/STAT pathway is activated in response to cytokines and growth factors. In addition, oxidative stress can activate
Excess production of reactive oxygen species (ROS) is an important mechanism underlying the pathogenesis of a number
Transmissible spongiform encephalopathies are a group of neurodegenerative disorders caused by a posttranslational, co
Green tea, owing to its beneficial effect on health, is becoming more and more popular worldwide. (-)-Epigallocatechin-3
Paraquat (PQ, 1,1'-dimethyl-4,4'-bipyridinium), a widely-used herbicide, has been suggested as a potential etiologic facto
The herbicide paraquat is a suspected etiologic factor in the development of Parkinson's disease (PD). Paraquat was there
Paraquat (1,1'-dimethyl-4,4'-bipyridinium) is structurally similar to the neurotoxin 1-methyl-4-phenyl-4-phenylpyridium i
In order to establish causal or protective treatments for Parkinson's disease (PD), it is necessary to identify the cascade of
Hystidyl-proline [cyclo(His-Pro)] is an endogenous cyclic dipeptide produced by the cleavage of thyrotropin releasing hor
XRCC1 is a critical scaffold protein that orchestrates efficient single-strand break repair (SSBR). Recent data has found an
Parkinson's disease (PD) features oxidative stress and accumulation of misfolded (unfolded, alternatively folded, or muta
Paraquat (PQ) (1,1-dimethyl-4,4'-bipyridinium dichloride), a widely used herbicide, has been suggested as a potential etic
Oxidative damage is involved in triggering neuronal death in several retinal neurodegenerative diseases. The recent findi
The major advantage of primary neuronal cultures for developmental neurotoxicity (DNT) testing is their ability to replica
BACKGROUND: Mitochondrial dysfunction has been implicated in the pathogenesis of Parkinson's disease (PD). Impairme
The role of autophagy as a survival strategy of cells constitutes an emerging topic in the study of the pathogenesis of seve
Mutations of the PINK1 gene are a cause of autosomal recessive Parkinson's disease (PD). PINK1 encodes a mitochondria
The precise mechanism underlying the role of nitric oxide (NO) or nitric oxide synthases (NOSs) in paraquat-mediated tox
Curcumin, the active compound of the rhizome of Curcuma longa has anti-inflammatory, antioxidant and antiproliferativ

to S-nitrosoglutathione (GSNO)-induce	InvAll	
roduction, we show that oxygen-gluco	InvAll	
ects of alpha-tocopherol on oxidative s	InvAll	NOADME
receptors in vitro, delaying apoptosis.	InvAll	NOADME
lear until now whether neurons are mo	InvAll	NOADME
g cells in the brain and are highly susc	InvAll	NOADME
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n's disease (PD). Paraquat is structural	InvAll	NOADME
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lay an important role in the degenerati	InvAll	NOADME
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imer's disease (AD), Parkinson's diseas	InvAll	NOADME
effects of vitamin E analogs on oxidati	InvAll	NOADME
t enzyme, Cu,Zn-superoxide dismutase	InvAll	NOADME
ely unknown. In this study, we tested th	InvAll	NOADME
PC12 cells. Pretreatment of sublethal c	InvAll	NOADME
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and amyotrophic lateral sclerosis. Thes	InvAll	
roduction of ROS is detrimental to cells	InvAll	NOADME
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-gallate (EGCG), the main ingredient of	InvAll	NOADME
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on (MPP+), the active metabolite of the	InvAll	NOADME
f deleterious events that lead to the dy	InvAll	NOADME
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association of XRCC1 with proteins cau	InvAll	
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l kinase of unknown function which is w	InvAll	NOADME
icity is yet to be fully elucidated. The in	InvAll	NOADME
e activities. This agent has been shown	InvAll	

SH-SY5Y cell line
Mixed neuronal and glial cultures
Primary culture from anterior striatum

human	24 hours	
rat	3 or 6 hours	
rat	24 hours	

500				1
300				1
0, 30, 100, 300 or 200 with varying Tocopherol concentrations				1

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Oxidative stress leads to the disruption of calcium homeostasis in brain neurons; however, the direct effects of oxidants c
Paraquat (1,1'-dimethyl-4,4'-bipyridinium), a widely used non-selective herbicide, is a redox cycling agent with adverse e
Epidemiologic and laboratory studies suggest that paraquat can be an environmental etiologic factor in Parkinson's disea
BACKGROUND: Mitochondrial oxidative stress is a contributing factor in the etiology of numerous neuronal disorders. Hc
Exposure to environmental pesticides can cause significant brain damage and has been linked with an increased risk of d
ABSTRACT Chlorpyrifos (CPF) is a widely used organophosphate insecticide. In addition to its known properties of choline
BACKGROUND AND PURPOSE: Nebivolol, a selective beta(1)-adrenoceptor antagonist mediating rapid vasodilating effect
Although oxidative stress is fundamental to the etiopathology of Parkinson disease, the signaling molecules involved in t
Reactive oxygen species (ROS) actively participate in microglia-mediated pathogenesis as pro-inflammatory molecules. H
When neural cells are exposed to paraquat, nitric oxide generation increases primarily due to an increase in the expressi
Paraquat (PQ) is a well-known herbicide that exerts its effects by elevating intracellular levels of superoxide. It has been
The effects of cannabinoids in mitochondria after acute oxidative stress insult are not fully established. We investigated t
Mitochondrial reactive oxygen species (ROS) play an important role in both physiological cell signaling processes and nun
This study aims to elucidate the processes underlying neuroprotection of kaempferol in models of rotenone-induced acu
Rasagiline is a propargylamine and irreversible monoamine oxidase (MAO) B inhibitor used for the treatment of Parkinso
Talipexole is a non-ergot dopamine (DA) agonist that has been used in the treatment of Parkinson's disease. In the prese
Triple A syndrome is named after the main symptoms of alacrima, achalasia, and adrenal insufficiency but also presents v
Paraquat produces dopaminergic pathologies of Parkinson's disease, in which cyclooxygenase-2 (COX-2) is implicated. Hc
BACKGROUND: Mutations in Parkin are the most common cause of autosomal recessive Parkinson disease (PD). The mitc
Apoptosis signal-regulating kinase 1 (ASK1) is activated by various types of stress, including, endoplasmic reticulum (ER) s
Mitochondrial dysfunction has been implicated in the pathogenesis of a number of neurodegenerative disorders includin
trans-Resveratrol (RES) is one of a number of dietary polyphenols that have been reported to beneficially affect human p
There are two causes of Parkinson's disease (PD): environmental insults and genetic mutations of PD-associated genes. E
Exposure to paraquat (PQ; N,N'-dimethyl-4-4'-bipyridium), a potent herbicide, can lead to neuronal cell death and increas
Oxidative stress plays pivotal roles in aging, neurodegenerative disease, and pathological conditions such as ischemia. W
Epidemiological and in vivo studies have demonstrated that exposure to the pesticides paraquat (PQ) and maneb (MB) in
Mitochondrial oxidative stress is a contributing factor in the etiology of numerous neuronal disorders. However, the prec
OBJECTIVE: To investigate the effect of paraquat on induction of cell damage and miR-133b expression in PC12 cells. MET
Previously, we have reported that a 10-amino acid peptide (MIIYRDLISH) derived from the NH(2)-terminus of the human
BACKGROUND: Neuronal iron accumulation is thought to be relevant to the pathogenesis of Parkinson's disease (PD), alt
Environmental neurotoxic exposure to agrochemicals has been implicated in the etiopathogenesis of Parkinson's disease
Paraquat is a cationic herbicide that causes acute cell injury by undergoing redox cycling. Oxidative stress is thought to be
BACKGROUND: TDP-43 proteinopathies are characterized by loss of nuclear TDP-43 expression and formation of C-termir
OBJECTIVE: To investigate the protective effects of the tert-butylhydroquinone (tBHQ) pretreatment on neurotoxicity anc
Parkinson's disease (PD) is one of the most common age-related neurodegenerative diseases and affects millions of peop
Paraquat is a widely used herbicide that is structurally similar to the known dopaminergic neurotoxicant 1-methyl-4-pher
AIMS: Delta(9)-tetrahydrocannabinol (Delta(9)-THC) is neuroprotective in models of Parkinson's disease (PD). Although C
Paraquat (PQ) was demonstrated to induce dopaminergic neuron death and is used as a Parkinson's disease (PD) mimeti
P-ATPases are membrane transporters energized by ATP. The subfamily of P(5)-ATPases is the least studied P-ATPases an
BACKGROUND AND PURPOSE The mechanisms of paraquat (PQ)-induced toxicity are poorly understood and PQ poisonin
TDP-43 proteinopathies are characterized by loss of nuclear TDP-43 and accumulation of the protein in the cytosol as ubi
In this study, we have compared several features of cell death triggered by classical inducers of apoptotic pathways (etop
In vitro and in vivo models of Parkinson's disease (PD) suggest that increased oxidant production leads to mitochondrial c
AIMS: Chronic exposure to environmental toxicants, such as paraquat, has been suggested as a risk factor for Parkinson's
Amyotrophic lateral sclerosis (ALS) is a progressive, fatal, motor neuron disease with no effective long-term treatment op
Mitochondria are considered major generators of cellular reactive oxygen species (ROS) which are implicated in the path
Three types of resveratrol analogues were designed, synthesized and evaluated in vitro against paraquat-induced apoptc

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Reactive oxygen species (ROS) function as modulators of pro-inflammatory processes in microglia-associated neurodeger
The loss of dopaminergic neurons induced by the parkinsonian toxins paraquat, rotenone, and 1-methyl-4-phenylpyridini
Paraquat (PQ) is a neurotoxic herbicide that induces superoxide formation. Although it is known that its toxic properties a
Paraquat (PQ), a cationic nonselective bipyridyl herbicide, has been used as neurotoxicant to modulate Parkinson's disea
Neural progenitor cells (NPCs) derived from human embryonic stem cells (hESCs) have great potential in cell therapy, dru
Our previous works have shown that the (NADPH) oxidase (Nox) enzyme, in particular Nox1, plays an important role in ox
Controversial reports on the role of autophagy as a survival or cell death mechanism in dopaminergic cell death induced
OBJECTIVE: To investigate effects of paraquat on the mRNA expression of key elements of Notch signaling (Notch1, Jagge
Paraquat (PQ) is one of the most widely used herbicides in the world. Although available evidence indicates that people e
Paraquat (PQ) is a widely used, highly toxic and non-selective contact herbicide, which has been associated with central r
The neurotoxin paraquat (PQ) causes apoptosis of dopaminergic neurons in mammalian cell culture and animal models, r
OBJECTIVE: To investigate the effects of paraquat on microRNA expressions in PCl2 cells, and to explore the regulatory m
Recent studies suggest that traumatic brain injury (TBI) and pesticide exposure increase the risk of Parkinson's disease (P
Mitochondrial reactive oxygen species are implicated in the etiology of multiple neurodegenerative diseases, including P
The developmental and stress-regulated alternative TrkAIII splice variant of the NGF receptor TrkA is expressed by advan
Parkinson's disease (PD) is a multifactorial disorder with a complex etiology including genetic risk factors, environmental
Aberration during the development of the central nervous system (CNS) due to environmental factors underlies a variety
It has been suggested that glial cells in the central nervous system might function as a buffer and protect neurons and syr
Omega-3 polyunsaturated fatty acid levels are reduced in the substantia nigra area in Parkinson's disease patients and ar
The olfactory bulb is one of the most vulnerable brain regions in age-related proteinopathies. Proteinopathic stress is mit
Paraquat (PQ) as a Parkinsonian mimetic has been demonstrated to impair dopaminergic (DAergic) neurons and is highly
Lithium is a mood stabilizing agent commonly used for the treatment of bipolar disorder. Here, we investigated the poter
Paraquat (PQ) was demonstrated to induce dopaminergic neuron death and is used as a Parkinson's disease (PD) mimeti
Intracytoplasmic inclusions of protein aggregates in dopaminergic cells (Lewy bodies) are the pathological hallmark of Pa
Oxidative stress or reduced expression of naturally occurring antioxidants during aging has been identified as a major cul
The mechanism of intracellular metabolism of methylmercury (MeHg) is not fully known. It has been shown that superox
Oxidative stress and the ubiquitin-proteasome system play a key role in the pathogenesis of Parkinson disease. Although
Compelling evidences have shown that diverse environmental insults arising during early life can either directly lead to a
Carnosic acid (CA) is a phenolic diterpene isolated from Rosmarinus officinalis and exerts anti-inflammatory, antioxidant,
Herbicides containing paraquat may contribute to the pathogenesis of neurodegenerative disorders such as Parkinson's d
Paraquat (PQ) exposure influences central nervous system and results in serious neurotoxicity in vitro and in vivo. Howev
OBJECTIVE: To investigate the role of Wnt signaling pathway on paraquat (PQ)induced PC12 cells damage. METHODS: Usi
Parkinson's disease (PD) is a neurodegenerative disorder characterised by the loss of dopaminergic neurons in the substa
OBJECTIVE: To explore the effect of paraquat (PQ) on autophagy in human embryonic neural progenitor cells. METHODS:
While environmental exposures are not the single cause of Parkinson's disease (PD), their interaction with genetic alterat
Tanshinone I (T-I; 1,6-Dimethylnaphtho[1,2-g][1]benzofuran-10,11-dione; C18H12O3), which may be found in Salvia milti

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The protective effect of tyrosol on apoptosis in PC12 cell induced by paraquat (PQ) was studied. The PC12 cell was culture
A combination of the herbicide paraquat (PQ) and fungicide maneb (MB) has been linked to Parkinson's disease. Previous
Both MPTP and MPP+ inhibited the NADPH-dependent microsomal LPO in mouse brain and lung. On the other hand, PQ
The effect of 1-methyl-4-phenyl-1,2,3,6-tetrahydropyridine (MPTP), 1-methyl-4-phenylpyridinium (MPP+) and 1,1-dimeth
We had previously reported that 1-methyl-4-phenyl-1,2,3,6-tetrahydropyridine (MPTP), which produces Parkinson's disea
The effects of 1-methyl-4-phenyl-1,2,3,6-tetrahydropyridine (MPTP), its metabolite 1-methyl-4-phenyl pyridinium ion (M
Glucocorticoids (GCs) disrupt the energy metabolism of neurons of the hippocampus, and thus leave them more vulneral
This study reports the effects of Ca2+ channel blockers (Ca antagonists) on intraneuronal Ca2+ ([Ca2+]i) movements and
1-Methyl-4-phenylpyridinium (MPP+), the active metabolite of 1-methyl-4-phenyl-1,2,3,6-tetrahydropyridine (MPTP) ser

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Organotypic cultures of the brain provide a unique opportunity to directly examine the regional vulnerability of specific b
Paraquat has been implicated as an environmental toxin which may induce the syndrome of Parkinson's disease after exp
Exposure to pesticides may be a risk factor for Parkinson's disease based on epidemiologic data in humans, animal model
Paraquat (1,1'-dimethyl-4,4'-bipyridinium, PQ) is a herbicide to possibly induce Parkinson's disease (PD), since a strong cc
Glutamate-mediated excitotoxicity might contribute to the pathogenesis of Huntington's disease and other polyglutamin
Environmental exposure to the oxidant-producing herbicide paraquat has been implicated as a risk factor in Parkinson's c
Mutations in Cu/Zn-superoxide dismutase 1 (SOD1) are responsible for a familial form of amyotrophic lateral sclerosis (FA
A loss of nigrostriatal dopaminergic neurons is the primary neurodegenerative feature of Parkinson's disease. Paraquat, a
The herbicide paraquat (PQ) has been implicated as a potential risk factor for the development of Parkinson's disease. In
Exposure of mice to the herbicide paraquat has been demonstrated to result in the selective loss of dopaminergic neuror
Paraquat, MPTP, and rotenone reproduce features of Parkinson's disease (PD) in experimental animals. The exact mecha
Nonsteroidal anti-inflammatory drugs (NSAIDs) have been shown to amplify the heat shock response in cell lines by incre
In recent years, several lines of evidence have shown an increase in Parkinson's disease (PD) prevalence in rural environn
Paraquat (PQ) is a cationic nonselective bipyridyl herbicide widely used to control weeds and grasses in agriculture. Epide
Parkinson's disease (PD) is a common neurodegenerative disorder and is characterized by the progressive loss of dopami
Parkinson disease (PD) is a common neurodegenerative disorder characterized by the progressive loss of dopaminergic n
The orphan nuclear receptor Nurr1 is required for the development of the ventral mesencephalic dopaminergic neurons.
Paraquat, N-methyl-4-phenyl-1,2,3,6 tetrahydropyridine, and rotenone have been shown to reproduce several features c
Toxic concentrations of paraquat (0.2mM, 24h) caused death of both mature and immature cerebellar granule neurons ((
Paraquat (PQ) is suspected to be an environmental risk factor for Parkinson's disease (PD). A strong correlation between
Paraquat (PQ) causes selective degeneration of dopaminergic neurons in the substantia nigra pars compacta, reproducin
An important feature of Parkinson's disease is the degeneration of dopaminergic neurons in the Substantia Nigra pars co
Parkinson's disease (PD) is a neurodegenerative disease that mainly affects dopaminergic (DA-ergic) neurons in the subst
Inhibition of mitochondrial complex I is one of the leading hypotheses for dopaminergic neuron death associated with Pa
BACKGROUND: Oxidative stress (OS) is an important factor in brain aging and neurodegenerative diseases. Certain neuro
Oxidative stress is the common downstream effect of a variety of environmental neurotoxins that are strongly implicatec
Both epidemiological and pathological data suggest an inflammatory response including microglia activation and neuro-i
Axonal degeneration is a common pathologic feature in peripheral neuropathy, neurodegenerative disease, and normal a
Mechanistic studies underlying dopaminergic neuron death may identify new drug targets for the treatment of Parkinsor
The effects of the 1-methyl-4-phenylpyridinium ion (MPP(+)) and some structurally related compounds on mitochondrial
Parkinson's disease (PD) has been linked to exposure to a variety of chemical (e.g., pesticides) and inflammatory agents,
The study of glial derived factors induced by injury and degeneration is important to understand the nervous system resp
We have previously demonstrated that alpha-synuclein overexpression increases the membrane conductance of dopami
Investigation of mechanisms responsible for dopaminergic neuron death is critical for understanding the pathogenesis of
The herbicide paraquat (PQ) has increasingly been reported in epidemiological studies to enhance the risk of developing
Primary cultures of fetal rat cortical neurons and astrocytes were used to test the hypothesis that astrocyte-mediated cor
This study determined how preconditioned neurons responded to oxygen-glucose deprivation (OGD) to result in neuropr
The present study was aimed at determining the role of paraquat (PQ) in the activation of the NF-E2-related factor 2 (Nrf
The neurotoxins paraquat (PQ) and dopamine (DA or 6-OHDA) cause apoptosis of dopaminergic neurons in the substantia
Accumulation of misfolded alpha-synuclein is the pathological hallmark of Parkinson's disease (PD). Nevertheless, little is
Recent findings implicate the calcium-permeable transient receptor potential (TRP) melastatin subtype 2 (TRPM2) and ca
The two hit hypothesis of neurodegeneration states that cells that have been severely stressed once are more vulnerable
Xenobiotic exposure is a risk factor in the etiology of neurodegenerative disease. It was recently hypothesized that restri
The herbicide paraquat is an environmental factor that may be involved in the etiology of Parkinson's disease (PD). Syste
Epidemiological and animal studies suggest that environmental toxins including paraquat (PQ) increase the risk of develo
The dual-hit hypothesis of neurodegeneration states that severe stress sensitizes vulnerable cells to subsequent challeng
Paraquat-stimulated NADPH-dependent lipid peroxidation in mouse brain and pulmonary microsomes was inhibited by s

rain regions like the hippocampus. Tw			InvAll	NOADME
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Paraquat stimulates NADPH-Fe(2+)-dependent microsomal lipid peroxidation in mouse brain and strongly inhibits it in th
The cytotoxicity of reactive oxygen species and related agents toward cultured rat adrenal medullary phenochromocyton
We have investigated the response to oxidative stress in a model system obtained by stable transfection of the human ne
In the central nervous system oxidative stress has been implicated in the pathology of several neurological disorders. The
The brain is particularly vulnerable to oxygen free radicals, which have been implicated in the pathology of several neuro
Amyotrophic lateral sclerosis (ALS) is a progressive neurodegenerative disorder characterized by the selective death of m
The last few decades have seen the marketing of hundreds of new pesticide products with a forecasted expansion of the
Oxidative stress has been considered as the leading cause of blood-brain barrier disruption which implicates many neuro
Filamentous inclusions of alpha-synuclein protein are hallmarks of neurodegenerative diseases collectively known as syn
The ability of brain tissue preparation to generate superoxide from xenobiotic interactions has been investigated. We sho
Nitric oxide synthase (NOS) oxidizes L-arginine to NO(&z.ccirf;) and L-citrulline. Recent studies have shown that this enzyr
Paraquat stimulated NADPH-dependent lipid peroxidation in mouse brain microsomes, while it suppressed lipid peroxida
BACKGROUND: An increase in reactive oxygen species (ROS) burden and subsequent oxidative damage to nucleic acids, p
Carnosic acid (CA; C20H28O4), which is also called salvin, is a major phenolic diterpene found in Rosmarinus officinalis L.
Pinocembrin (PB; 5,7-dihydroxyflavanone; C15H12O4) is a flavonoid found in propolis and exerts antioxidant, anti-inflam
ETHNOPHARMACOLOGICAL RELEVANCE: Parkinson's disease (PD) is a multifactorial neurodegenerative disorder affecting
Paraquat is a neurotoxic agent, and oxidative stress plays an important role in neuronal cell death after paraquat exposur
Rat cultured cerebellar granule neurons (CGNs) were not sensitive to CuCl2 (1-10 microM, 24 h), whereas paraquat (150 r
Mitochondrial dynamics and quality control plays a critical role in the maintenance of mitochondrial homeostasis and fur
Oxidative stress, concomitant to injury and degeneration in the CNS, triggers the release of many glial derived factors. Ap
Mitochondrial oxidative stress is a contributing factor in the etiology of numerous neuronal disorders. However, the prec
BIOSIS COPYRIGHT: BIOL ABS. Cells from the midbrain micromass cell culture system from rat day 13 embryos were used
Cells from the midbrain micromass cell culture system from rat day 13 embryos were used to investigate the developmer
Objective To evaluate the protective effect of peanut sprout extract (PSE) against paraquat (PQ) induced SK-N-SH cells. M
Purpose: To investigate whether two synthetic prenylated xanthone analogues -1,3,6,8-tetrahydroxy-9H-xanthen-9-one (
Oxidative stress caused by an increase in free radicals plays an important role in neuronal death. We investigated the effe
Oxidative stress and apoptosis play pivotal roles in the pathogenesis of neurodegenerative diseases. We investigated the
Background and purpose: Resveratrol (RSV) is a naturally existing polyphenolic compound abundantly found in grapes an
Paraquat (PQ) through electron transfer reactions with NADH-dependent oxidoreductase of mitochondria and NADPH-de
Amyloid ?-peptide (A?) and Paraquat PQ induce oxidative stress in astrocytes by formation of reactive oxygen species (RO
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1. Objectives Mutations in the PINK1 gene are responsible for autosomal recessive Parkinson's disease (PD). The project a

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